CLAIMS

What I claim as my invention is:

1. An electro-mechanical, microwave load pull tuner comprising a test port (the port closest to the DUT) and an idle port, a horizontal transmission airline in form of a slotted coaxial or parallel plate airline (slabline), two sliding carriages carrying a metal-dielectric combination probe each and means for remote horizontal position control of the said combination probes.

2. An electro-mechanical tuner as in claim 1, where the said combination probes are made of a cylindrical horizontal dielectric insert, which slides on the central conductor of the slotted airline, which said insert is embedded inside a metallic square slug, which said slug slides inside and along the ground walls of the slotted airline, parallel to the central conductor.

3. A set of metal-dielectric combination probes, as in claim 2, where the external diameter of the dielectric core of the probe varies between the two extremes, zero (pure metallic probe) and the width of the slot of the airline (pure dielectric probe).

4. A set of combination probes, as in claim 2, used in electro-mechanical tuners as in claim 1, with several diameters of the dielectric core of the probe and corresponding openings of the housing metallic slugs, such as for the dielectric cores to fit firmly in the opening of the metallic housing, slide freely on the central conductor of the slotted airline and move together with the metallic housing as a single entity.

5. A calibration method for said electromechanical tuner of claim 1, in which scattering parameters (S-parameters) are measured using a calibrated vector network analyzer (VNA) between the test and idle port of the tuner over a given frequency range of operation, as a function of the horizontal position of each combination probe related to the test port of the tuner, and saved in a calibration data file for later use.

6. A calibration method for said electromechanical tuner of claim 1, in which S-parameters of said tuner are measured in three steps, step 1 consisting of measuring S-parameters of the total tuner two-port as a function of the position of the first probe, the second probe being stationary close to the idle port, step 2 consisting of measuring S-parameters of the tuner as a function of the position of the second probe, the first probe being stationary close to the test port and cascading the result with the inverse S-parameters of the tuner two-port, measured when both probes are at their stationary (initial) position, probe 1 close to the test port and probe 2 close to the idle port, and step 3 consisting of saving the S-parameters of step 1 and step 2 in a calibration data file, ready for retrieval.